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Synthesis and functionalization of AgNPs

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An abbreviated version of this protocol was published in Science in Nov 2020

Neuropilin-1 facilitates SARS-CoV-2 cell entry and infectivity

DOI: 10.1126/science.abd2985

Detailed protocol

$AgNO_3$(50.4 mg) was dissolved in the dark in 1 ml of Milli-Q water(MQ, resistivity 18 MΩcm) and added to 500 ml of water heated at 65 °C in a glass flask cleaned with Piranha solution ($H_2SO_4$and H_2O_2;Caution: highly oxidizing acid solution). Tannic acid (1.2 mg) was dis-solved in 10 ml of MQ and 200 mg of citrate tribasic dihydrate was added to the solution. This mixture was added to the $AgNO_3$solution in the reaction vessel. The mixture was vigorously stirred at ~ 70 °C and the reaction was allowed to proceed for 3 min, at which point the so-lution turned yellow. Theflask was then transferred to a pre-heated hot-plate, boiled for 20 min, and left to cool down to RT. The boiled-off volume was reconstituted with fresh MQ.The particles were functionalized with NeutrAvidin (NA) to allow conjugation with biotinylated-peptides and lipoic acid-polyethyleneglycol(1 k)-NH_2 (PEG) as previously described (.B. Braun, T. Friman, H.B. Pang, A. Pallaoro, T.H. De Mendoza, A.M.A. Willmore,V.R. Kotamraju, A.P. Mann, Z.G. She, K.N. Sugahara, N.O. Reich, T. Teesalu,E. Ruoslahti, Etchable plasmonic nanoparticle probes to image and quantify cellular internalization, Nat. Mater. (2014),)

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1. Cantuti-Castelvetri, L. (2021). Synthesis and functionalization of AgNPs. Bio-protocol Preprint. bio-protocol.org/prep791.
2. Cantuti-Castelvetri, L., Ojha, R., Pedro, L. D., Djannatian, M., Franz, J., Kuivanen, S., Meer, F. V. D., Kallio, K., Kaya, T., Anastasina, M., Smura, T., Levanov, L., Szirovicza, L., Tobi, A., Kallio-Kokko, H., Österlund, P., Joensuu, M., Meunier, F. A., Butcher, S. J., Winkler, M. S., Mollenhauer, B., Helenius, A., Gokce, O., Teesalu, T., Hepojoki, J., Vapalahti, O., Stadelmann, C., Balistreri, G. and Simons, M.(2020). Neuropilin-1 facilitates SARS-CoV-2 cell entry and infectivity. Science 370(6518). DOI: 10.1126/science.abd2985

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